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Moderating Effects of Race in Clinical Trial Participation and Outcomes among Marijuana-Dependent Young Adults

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Abstract

BACKGROUND—Few studies have examined clinical trial participation rates and treatment outcomes among underserved young adults who are dependent on marijuana, the most commonly abused illicit drug.

METHOD—The present study was a secondary analysis of a trial of court-referred marijuana-dependent young adults (ages 18–25) randomized to one of four treatment conditions: Motivational Enhancement Therapy/Cognitive Behavioral Therapy (MET/CBT), MET/CBT + Contingency Management (CM), Drug Counseling (DC) or DC + CM. African American ($N = 81$) participants were compared to White ($N = 31$) participants with respect to rates of participation in phases of treatment and substance use outcomes. In addition, the interaction of race and treatment condition was examined to ascertain if the interventions yielded different effects based on race.

RESULTS—Among those who started treatment, African American young adults were significantly less likely to complete the treatment and posttreatment phases of the clinical trial than their White counterparts. Irrespective of treatment type, substance use outcomes (i.e., percentage of marijuana-negative specimens and longest duration of continuous abstinence) did not vary by race. However, there was a significant interaction effect between treatment type and race; African American young adults did not benefit differentially from any specific type of treatment, but CM was effective in reducing proportion of marijuana positive samples among White young adults.

CONCLUSIONS—Findings suggest that clinical trial treatment and posttreatment completion rates vary by race in this population, as does response to specific treatment types. More treatment research focusing specifically on African American marijuana-dependent young adults is warranted.

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Contributors

Ms. Montgomery undertook the statistical analysis and wrote the first draft of the manuscript. Dr. Carroll suggested statistical analysis and provided comments on drafts of the manuscript. Dr. Carroll also served as Principal Investigator of the parent study. Dr. Petry suggested and interpreted analyses and edited drafts of the manuscript.

Conflict of Interest

The authors declare that they have no conflict of interest.

Keywords

Marijuana; Clinical Trials; Race; Disparities

1. Introduction

Marijuana is the most widely used illicit drug in the United States. Among youth who smoke marijuana, 26% meet Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM-IV; American Psychiatric Association (APA), 1994) criteria for marijuana abuse or dependence (Wu et al., 2011). Further, the prevalence of marijuana abuse and dependence has significantly increased among young African American men and women between the ages of 18–29 in recent years (Compton et al., 2004). Given the strong link between early marijuana use and future problems, such as a greater involvement with other illicit drugs and an increased risk of developing psychiatric and occupational problems (Copeland and Swift, 2009), it is important to intervene early in the process to prevent harmful consequences in the future. Research suggests that more substance users are involved with the legal system than the substance abuse treatment system (Weisner and Schmidt, 1995). Further, African American youth (ages 12–18) and young adults (18–25) have been shown to be more likely than other racial/ethnic groups to enter the healthcare system through the legal system and more likely to end up in the juvenile justice system than the specialty care system when they get into trouble in their community (Heflinger et al., 2006; Sinha et al., 2003). Therefore, one intervention approach might include examining and improving treatment outcomes among marijuana-dependent young adults who are court-referred to substance abuse treatment, especially among African American young adults given the increased use of marijuana in this population (Carroll et al., 2006).

Treatment admission rates for marijuana dependence have increased by 30% across the nation from 1998 to 2008 (Substance Abuse and Mental Health Services Administration, 2010). Further, approximately half of the individuals who enter treatment for marijuana use are young adults under the age of 25 (Budney et al., 2007). Despite an increase in treatment utilization among young adults, there has only been a limited, yet promising, amount of empirical studies evaluating treatment for marijuana use disorders (Moore and Budney, 2003; Peters et al., 2011). Some studies have demonstrated the effectiveness of relapse prevention (Stephens et al., 1994), Motivational Enhancement Therapy (MET; Stephens et al., 2000) and a combination of MET and Cognitive-Behavioral Therapy (CBT; Dennis et al., 2004; Marijuana Treatment Project Research Group, 2004) in reducing marijuana use. In addition, contingency management (CM; i.e., voucher-based incentives) as an adjunct to MET and CBT interventions (Budney et al., 2000; Carroll et al., 2006; Kadden et al., 2007; Litt et al., 2008; Stanger et al., 2009) has resulted in longer periods of marijuana abstinence during treatment. However, few studies focus specifically on racial variation in marijuana treatment outcomes, especially among young adults referred to treatment by the criminal justice system (Johnson et al., 2004). This gap in the literature is a concern given strong evidence for racial health disparities in treatment access, retention and outcome among young adults (Cook and Alegria, 2011; Zuvekas and Taliaferro, 2003).

Several studies have revealed racial differences in substance abuse treatment among young adults. For example, Becker et al. (2011) found racial differences in substance use and psychosocial problems among African American, Hispanic and White adolescents between the ages of 13–21 participating in five sessions of MET/CBT for substance abuse. Findings revealed that African American adolescents demonstrated less frequent substance use and less psychiatric comorbidity than White or Hispanic adolescents. Other studies have also demonstrated racial differences in prevalence rates of substance use disorders (Wu et al.,

2011) and service utilization and preferences (Campbell et al., 2006). For instance, Alegria et al. (2011) found that among adolescents (ages 12–18) with substance use disorders, African American adolescents reported receiving less specialty and informal care as compared to their White counterparts. In addition, research suggests that the African American population (and younger individuals between the ages of 18 and 35) is the most underrepresented group in randomized clinical trials for substance abuse treatment (Korte et al., 2011). Furthermore, when young African American youth and young adults (ages 13–21) do enroll in randomized clinical trials, they are less likely to complete post-treatment assessments than other racial groups (Becker et al., 2011). These findings raise the possibility that racial variations in clinical trial participation and evidence-based treatment outcomes exist among court-referred marijuana-dependent young adults. This idea warrants further attention in the literature and serves as the basis for the present study.

Several studies have demonstrated that ethnic minorities between the ages of 18–35 are less likely than their White counterparts to participate in clinical trials (Korte et al., 2011; Magruder et al., 2009). Further, when ethnic minorities do participate in clinical trials, researchers often combine all of the ethnic minorities into one group and compare them to non-ethnic minorities (Burlew et al., 2009). Although this approach provides preliminary findings about racial differences in treatment outcomes, the data analytic plan does not consider the heterogeneity between (or within) racial groups. For example, Winhusen et al. (2008) found that pregnant ethnic minority substance using adults participating in MET reported a greater decrease in substance use than those in standard treatment. Although these data suggest specific types of treatments may be promising for ethnic minorities, it is not clear if the findings apply to all ethnic minorities or only specific racial groups. The lack of clarity in findings is a huge concern, especially among African American individuals, given the significant increase in the prevalence rates of marijuana abuse and dependence among young African American men and women (ages 18–29) in recent years (Compton et al., 2004) and the critical need for more effective treatments for court-referred African American young adults (Gil et al., 2004). Therefore, researchers suggest that future studies should examine the intersection of race and substance abuse treatment outcomes by conducting separate analyses for racial groups or including race as a moderator (Burlew et al., 2011).

Following this recommendation, the present study is a secondary analysis of data designed to determine if participation in a randomized clinical trial (Carroll et al., 2006) varied by race and if race moderates the relationship between treatment (i.e., MET/CBT, MET/CBT+CM, Drug Counseling (DC), or DC+CM) and outcomes among African American and White marijuana-dependent young adults court-referred to substance abuse treatment. The parent study (Carroll et al., 2006) found a significant main effect of CM on substance use and retention outcomes, and the strongest effects among individuals who received in MET/CBT+CM. In addition, participants in the MET/CBT condition continued to reduce their frequency of use during treatment and throughout the follow-up phase. Although the findings are promising for court-referred marijuana-dependent young adults, it is not clear if the findings apply to all of the racial/ethnic groups represented in the parent study. A recent study of African American, White, Hispanic and American Indian/Alaska Native juvenile justice-involved youth (ages 14–18) revealed significant racial/ethnic group differences in risk factors and substance use patterns (Feldstein et al., 2011). Specifically, White youth reported the highest levels of substance use (alcohol, tobacco, marijuana and other illicit hard drugs) and substance-related individual level risk factors (externalizing behaviors), while their African American counterparts reported the lowest rates for substance use and individual level risk factors. These findings emphasize the importance of examining racial/ethnic differences among youth and young adults who are involved in both the substance abuse treatment and legal systems.

Specifically, the study was designed to (1) examine racial differences in multiple phases (i.e., screening, eligibility, starting treatment, completing treatment, and completing posttreatment assessments) of randomized clinical trial participation, (2) examine racial differences in substance use outcomes (i.e., percentage of marijuana-negative specimens and longest period of continuous abstinence during treatment) irrespective of treatment type, and (3) determine if race influences the relationship between treatment type (i.e., MET/CBT and DC versus MET/CBT + CM and DC + CM, MET/CBT versus DC) and substance use outcomes among marijuana-dependent young adults. Based on prior research (e.g., Cook and Alegria, 2011), it was hypothesized that African American young adults would have higher attrition rates than White young adults, especially during the phases following randomization (i.e., treatment and follow-up phases). There is not enough research on racial/ethnic differences in treatment to support the idea that race would influence the relationship between race and treatment outcomes generally for young marijuana-dependent adults, or interactions between race and specific interventions and treatment outcomes. Therefore, the other aims were exploratory in nature.

2. Method

2.1 Participants

Participants were 112 young adults between the ages of 18–25 who were court-referred to marijuana-dependence treatment at a community based treatment program in Connecticut. As noted in a paper describing the parent study (Carroll et al., 2006), participants also had to meet DSM-IV (APA, 1994) criteria for marijuana dependence. Participants were excluded from the study if they (1) had severe substance dependence that required inpatient treatment and detoxification as determined by a team of licensed mental health professionals, (2) submitted a marijuana negative urine specimen at baseline, (3) had current physical dependence on alcohol or opioids, (4) had a current psychotic disorder, (5) were involved in other treatment for marijuana within 60 days of beginning the study, (6) were at current homicidal risk, (7) were unable to commit to the 1-year follow up, (8) had a score of less than 25 on the Mini-Mental State examination, or (9) had severe medical problems.

This study examined racial differences in clinical trial participation from the screening process to posttreatment completion. Therefore, data provided by 175 individuals (African American [$n = 117$] and White [$n = 58$]) who were screened for participation were included in the clinical trial participation analyses. Further details are provided in Table 1.

Of the 175 individuals screened for participation, 39 youth did not meet inclusion criteria. The parent study randomized 136 participants to four treatment conditions. Because 24 randomized individuals did not fall into one of the two racial categories under investigation in the present study, they were excluded from analyses, resulting in a total sample of 112 youth for the treatment outcome analyses. Demographic, substance use, and psychosocial functioning variables at baseline for the 112 randomized individuals by race are presented in Table 2. Further details about the entire sample are presented elsewhere (Carroll et al., 2006).

2.2 Measures

Urine Toxicology Screens—Participant urine toxicology screens (Varian OnTrak Testcup 5 with adulterant checks) were obtained weekly during treatment. The screens were used to assess the percentage of marijuana-negative specimens submitted weekly during the active phase of treatment. .

Timeline Followback Method—The maximum number of days of continuous marijuana abstinence during the active phase of treatment was assessed by data provided on the Timeline Followback Method (TLFB). The TLFB is a reliable and valid self-report measure for assessing substance use (marijuana, cocaine, alcohol, methamphetamine, benzodiazepines, opioids and other illicit substances) on a day-by-day basis (Ehrman and Robbins, 1994; Fals-Stewart et al., 2000; Sobell and Sobell, 1992). Participant self-reports of marijuana use were verified through urine toxicology screens obtained weekly during treatment and at each follow-up assessment. (Further details about the consistency of participant self-report data and urine toxicology screens are provided in the parent study; Carroll et al., 2006).

Participation Rates—Eligibility (eligible vs. not eligible) percentages were based on the number of participants deemed eligible divided by the total number of participants screened for the study. Randomization (randomized vs. not randomized) percentages were based on the number of participants randomized divided by the number of participants deemed eligible to participate. The start rate (treatment starters vs. non-treatment starters) percentages were based on the number of participants who attended at least one treatment session divided by the number of participants who were randomized to a treatment group. The completed treatment rates (treatment completers vs. non-treatment completers) were based on the number of participants who attended a session in the last week of treatment divided by the number of participants who started treatment. The 3 month and 6 month follow up completion percentages (posttreatment completers vs. non-posttreatment completers) were based on the number of participants who completed at least one assessment measure divided by the number of participants who were randomized to a treatment group.

2.3 Procedures

Individuals between the ages of 18 and 25 years who were referred to treatment for marijuana dependence by the adult probation office to a community based treatment program in New Haven, Connecticut were screened for participation in the present study. After the screening process, potentially eligible and interested participants signed Yale School of Medicine Human Investigation Committee approved informed consent forms and completed baseline assessments. Participants were then randomized to one of four manualized individual therapy treatment sessions delivered weekly by master's-level and doctoral-level clinicians over an 8-week period (active phase): MET/CBT alone, DC alone, MET/CBT + CM, and DC + CM. MET/CBT therapists focused on helping participants build motivation for change and implementing skills to reduce marijuana use using the Marijuana Treatment Project (MTP Research Group, 2004) manual. DC therapists emphasized achieving abstinence from marijuana and other drugs through concepts compatible with a 12-step approach (Mercer and Woody, 1999). Young adults assigned to the CM condition received vouchers redeemable for goods or services purchased by study staff (Higgins et al., 1991). Participants received vouchers for attending treatment sessions and submitting marijuana-free urine specimens. Participants received a voucher worth \$25 for the first session attended with increases in \$5 increments for each consecutive session attended up to a maximum of \$340. With respect to marijuana-free urine specimens, participants received \$50 in vouchers for the first marijuana-free specimen within increases in \$5 increments for each consecutive marijuana-free specimen up to a maximum of \$540. Therefore, participants could earn up to a total of \$880 worth of vouchers. Further details about the interventions and a CONSORT diagram are provided in the parent study (Carroll et al., 2006). Participants' substance use, retention and other psychosocial functioning outcomes were assessed at baseline, weekly during treatment, at the 8 week treatment termination point, and at a 3 and 6 month follow-up.

2.4 Data Analyses

Preliminary analyses included chi-square tests and *t*-tests to determine if baseline characteristics of young adults in the study varied across the two racial groups. The skewness and kurtosis of continuous variables were examined to determine if data transformations were needed prior to analyses. All variables were normally distributed and did not require transformations.

To evaluate if racial differences existed in participation rates, chi-square tests compared racial groups with respect to: eligibility status among those who consented for the study, randomization status among those who were study eligible whether patients began treatment, whether they completed treatment and whether they completed the 3 and 6 month posttreatment assessments.

To examine if race influenced substance use treatment outcomes irrespective of treatment type, General Linear Modeling (GLM) was used to test the association between race (i.e., African Americans and Whites) and primary substance use outcomes: percentage of marijuana-negative urine specimens during active treatment and maximum number of days of continuous marijuana abstinence during active treatment using urine sample toxicology results to determine abstinence.

To evaluate the moderating effects of race on response to study treatments, GLM was used with treatment type (i.e., MET/CBT versus DC, MET/CBT + CM and DC + CM versus MET/CBT and DC) and race as independent variables and substance use outcomes (i.e., percentage of marijuana-negative urine specimens and maximum number of days of continuous abstinence) as the dependent variables. The interaction effect between race and treatment type was tested in this model.

3. Results

3.1. Sample characteristics by race

As shown in Table 1, there were no statistically significant differences between racial groups randomized to treatment conditions with the exception of age and the number of months incarcerated. African American participants were significantly older than White participants ($t = -3.15$, $df = 110$, $p < .05$). In addition, African American participants reported significantly longer durations of incarceration than White participants ($t = -3.60$, $df = 110$, $p < .01$).

3.2 Trial retention by race

Chi-square tests revealed no significant differences between the proportion of African American and White young adults who were eligible for treatment, randomized, or began treatment (Table 2). Significant racial differences did emerge among young adults who completed treatment and among those who completed posttreatment assessments. African American young adults were less likely to complete the treatment phase ($\chi^2 = 4.23$, $df = 1$, $p = .04$) and the 3 month ($\chi^2 = 11.18$, $df = 1$, $p < .01$) and 6 month follow-up ($\chi^2 = 5.40$, $df = 1$, $p = .03$) than White young adults.

3.3 Main effects of race on substance use outcomes

GLM analyses revealed no significant differences among African American ($M = .25$, $SD = .37$, $n = 78$) and White young adults ($M = .40$, $SD = .42$, $n = 30$) in the percentage of marijuana-negative urine specimens during the active phase of treatment, $F(1, 108) = 3.35$, $p = .07$, $\eta^2 = .03$. There were also no significant differences in the maximum number of days of continuous abstinence between African American ($M = 23.88$, $SD = 20.77$, $n = 76$)

and White ($M = 27.06$, $SD = 22.79$, $n = 31$) young adults $F(1, 105) = 1.82$, $p = .18$, $\eta^2 = .02$.

3.4 Race as a moderator of treatment effects

The interaction effect between race and treatment type was not significant when comparing MET/CBT versus DC with respect to proportion of negative samples, $F(1, 103) = .15$, $p = .12$, $\eta^2 = .03$ or longest duration of continuous abstinence, $F(1, 102) = .23$, $p = .09$, $\eta^2 = .04$. Results revealed a significant interaction between race and CM (i.e., MET/CBT + CM and DC + CM) versus non-CM (i.e., MET/CBT and DC) treatment, $F(1, 104) = 2.76$, $p = .04$, $\eta^2 = .06$ on the percentage of marijuana-negative urine specimens, as shown in Figure 1. Specifically, White participants benefited from CM treatment, with White participants who received CM submitting over 50% marijuana negative samples versus only about one-third negative samples when they did not receive CM. In contrast, less than a third of samples were marijuana negative among African American participants, regardless of whether or not they received CM. The interaction effect between race and CM versus non CM treatment did not reach significance with respect to the maximum number of days of continuous abstinence, $F(1, 101) = 2.31$, $p = .10$, $\eta^2 = .05$ but trends were in similar directions as shown in Figure 2. (Note: when age and time incarcerated were included as covariates in the model, neither variable was significantly associated with outcomes, $p > .05$, and inclusion of these covariates did not impact the significant associations between race and outcomes or the interaction between race and treatment condition and outcomes reported above.)

4. Discussion

This secondary analysis of a randomized clinical trial was designed to examine clinical trial participation and treatment outcomes among marijuana-dependent African American and White young adults. African American young adults were less likely to complete the treatment and posttreatment phases of the clinical trial than White young adults. Furthermore, results revealed a strong CM effect among White young adults, but no CM effect among their African American counterparts.

This study extends the literature suggesting that African American young adults are less likely than their White counterparts to be retained in substance abuse clinical trials (Burlew et al., 2011a; Korte et al., 2011). To our knowledge, this study is the first to examine study participation by racial group effects specifically among marijuana-dependent young adults. Findings reveal that while a comparably large number of African American participants were screened, deemed eligible and started the trial, a much smaller percentage actually completed the treatment and posttreatment phases. One possible explanation for this finding is mistrust of the research community among African American participants (e.g., Corbie-Smith et al., 2002; Shavers-Hornaday et al., 1997) that might be especially heightened among court-referred participants. For example, African American participants might also worry that the information they provide in a research study could be used against them in court. As noted in Table 1, African American and White participants did not differ with respect to severity of substance use disorders, so it is unlikely substance use severity differentially impacted retention differences by race. Further evaluation of variables that impact treatment and follow-up completion rates may elucidate methods to improve treatment participation rates, especially among African American marijuana-dependent young adults court-referred to treatment.

These retention findings accentuate the need for more research regarding how to retain African American young adults in clinical trials. Future studies should draw on existing broader research on ethnic minority retention in clinical trials (Alvarez et al., 2006; Burlew et al., 2011a; Burlew et al., 2011b; Dancy et al., 2004; Faseru et al., 2010; Fouad, 2009;

Harris et al., 2003; Korte et al., 2011; Okuyemi et al., 2007). For example, Fouad (2009) discussed several strategies that would increase retention rates among ethnic minorities, including greater involvement of minority investigators and public awareness campaigns that discuss the benefits of participating in clinical trials. Other teams have also suggested cultural adaptations of traditional research methods, such as conducting research within ethnic minority communities (e.g., churches; Stahler et al., 2007 and barbershops; Releford et al., 2010) instead of traditional substance abuse clinics, to enhance retention.

The parent study revealed a strong beneficial effect of CM (Carroll et al., 2006), but these secondary analyses found that a racial group by CM effect was present in terms of proportion of negative samples submitted. Specifically, White participants benefitted from CM but African American participants did not. This finding is inconsistent with that of Barry et al. (2009), who found that CM was an effective treatment for cocaine-dependent clients in methadone maintenance treatment, regardless of ethnicity. Differences between studies may have related to the populations, as this study included court referred young adults, and the other voluntary admissions for cocaine-dependent methadone maintained adults.

Given the poor effect of CM in this population in conjunction with a strong emphasis on family in the African American community (Breland-Noble et al., 2006), future studies of substance abusing young adults could examine the role of family-based contingency models, such as the family management curriculum from the Adolescent Transitions Program (Dishion et al., 2002). In addition, Kamon et al. (2005) also found preliminary support for a family-based contingency model in which parents and adolescents worked together to maintain drug abstinence and address other related behavioral problems. Other studies also support the effectiveness of family-focused interventions (e.g., Multidimensional Family Therapy; Liddle et al., 2004 and Strong African American Families-Teen program; Brody et al., 2012) in treating substance abuse among ethnic minority youth. Further, research should also consider the influence of other cultural factors, such as racial identity (Harkley et al., 2002) and community involvement (Turner and Wallace, 2003), in treating marijuana-dependence in African American young adults as well as the feasibility and acceptability of CM interventions.

African American individuals may also benefit from an increase in the magnitude of reinforcements, particularly among young adults involved in the criminal justice system. Larger reinforcement magnitude improves effect sizes of CM (Lussier et al., 2006), and although the total magnitude of reinforcement (i.e., \$880 over 2 months) in the present study was consistent with the density shown in other CM effectiveness studies (Higgins et al., 1991), African American participants only earned an average of \$253.45 ($SD = 231.48$). Future studies are needed to explore the influence of the effect of magnitude of reinforcement in CM on treatment outcomes in this population.

Although other studies of CM in marijuana dependent youth and young adults observed strong effects of CM in overall samples not stratified by race (Budney et al., 2000; Carroll et al., 2006; Kadden et al., 2007; Litt et al., 2008; Stanger et al., 2009), results from this study suggest that race should be evaluated rather than assuming that the overall outcomes obtained are generalizable to specific ethnic groups (Burlew et al., 2011a). For example, another study of adult substance abusers (Ball et al., 2007) revealed no retention differences between MET and standard care in the primary analyses. However, a secondary analysis including only the African Americans in the sample revealed retention differences among African American women in the sample (Montgomery et al., 2011). The present study suggests that treatment analyses by race are also warranted among marijuana-dependent young adults, and may be important for other populations as well.

The major strength of this study was the examination of racial variation in clinical trial participation rates and treatment outcomes specifically among an underserved population of African American and White marijuana-dependent young adults referred by the criminal justice system. Second, the two primary outcomes are sensitive indicators of CM effects in populations in which baseline rates of substance use are high. In contrast, an important limitation is that the interaction effect found in this study was significant for one outcome (i.e., percentage of marijuana-negative specimens), but not the other (i.e., longest duration of continuous abstinence during treatment). Other limitations include a small sample size, especially when groups were stratified by race. The sample was predominately male, so it is unclear if the findings are generalizable to female marijuana-dependent young adults. Further, marijuana use was the target of this intervention. Other drug and alcohol use was monitored closely but was minimal in the sample (4.27 [$SD = 6.68$] and .08 [$SD = .46$] days of use for alcohol and cocaine, respectively). Although no known studies demonstrate drug use substitution in CM studies (e.g., Kadden et al., 2009), additional research is needed to assess the impact of these interventions on other drug use outcomes and if other drug use varies by race. Other strengths and limitations of the design are noted in the parent study (Carroll et al., 2006).

This study underscores the need for more research on racial variation in clinical trial participation and treatment response. Our findings represent an important first step in this regard. Findings from this study suggest that clinical trial completion and follow-up rates vary by race, especially among African American young adults and response to treatment is related to treatment conditions among White young adults, but not among African American young adults. More studies are needed to identify cultural differences (e.g., racial identity, worldview, etc.) that might explain the racial variation in response to specific empirically supported substance abuse treatments. Future studies should also continue to examine effective ways to retain African American young adults in substance abuse clinical trials and to how to effectively use CM, or other interventions that may be effective in this population, to treat marijuana use.

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Figure 1.
Average percentage of marijuana-negative urine specimens by racial and treatment group.
(1) MET/CBT + CM = Motivational Enhancement Therapy/Cognitive-Behavioral Therapy + Contingency Management, (2) DC + CM = Drug Counseling + Contingency Management, (3) MET/CBT/no CM = Motivational Enhancement Therapy/Cognitive-Behavioral Therapy without Contingency Management, (4) DC/no CM = Drug Counseling without Contingency Management. Standard deviations for African Americans and Whites, respectively: (1) .33, .45, (2) .35, .51, (3) .45, .43, (4) .39, .42

Figure 2.

Average maximum number of days of continuous abstinence by racial and treatment group.

(1) MET/CBT + CM = Motivational Enhancement Therapy/Cognitive-Behavioral Therapy + Contingency Management, (2) DC + CM = Drug Counseling + Contingency Management, (3) MET/CBT/no CM = Motivational Enhancement Therapy/Cognitive-Behavioral Therapy without Contingency Management, (4) DC/no CM = Drug Counseling without Contingency Management. Standard deviations for African Americans and Whites, respectively: (1) 19.65, 23.54, (2) 20.59, 23.58, (3) 22.18, 22.90, (4) 14.73, 22.09.

Table 1

Baseline Characteristics by Race for Randomized Participants

Variable	African American		White		Total		Analysis		
	(n = 81)		(n = 31)		(n = 112)		χ^2	df	p
	%	%	%	%	%	%			
Men	94	81			90		4.39	1	0.07
Women	6	19			10				
Education									
Some college	17	26			20				
High school	42	16			35		6.83	2	0.08
<High school	40	55			44				
Single or divorced	96	94			96		1.39	1	0.49
Employment									
Full time	21	26			22				
Part time	24	39			27		6.31	2	0.27
Unemployed	55	35			51				
DSM-IV Disorders									
Lifetime alcohol use disorder	24	26			24		0.07	1	0.81
Lifetime anxiety disorder	21	19			21		0.05	1	0.09
Lifetime depressive disorder	10	13			11		0.21	1	0.73
Antisocial personality disorder	47	33			41		1.59	1	0.28
Treatment Groups									
MET/CBT + CM	21	29			23				
DC + CM	32	10			26		5.92	3	0.12
MET/CBT	23	32			26				
DC	24	29			25				
	M	SD	M	SD	M	SD	t	df	p
Age (years)	21.5	2.1	20.2	1.9	21.6	2.2	-3.15	110	<.05
Arrests, lifetime (n)	5.9	5.6	5.1	4.4	5.7	5.3	-0.66	110	0.51
Time incarcerated (months)	11.7	16.0	1.2	3.6	8.7	14.5	-3.60	110	<.01

Variable	African American		White		Total		Analysis		
	(n = 81)		(n = 31)		(n = 112)				
	%		%		%		χ^2	df	p
Age at first alcohol use (years)	13.9	2.5	16.1	9.7	15.5	8.4	-1.23	110	0.22
Age at first marijuana use (years)	14.7	1.8	14.1	1.9	14.5	1.9	-1.23	110	0.22
Marijuana use in past 28 days (days)	14.4	10.4	13.1	10.5	14.0	10.4	-0.56	110	0.58
Alcohol use in past 28 days (days)	2.5	4.3	3.1	4.1	2.7	4.2	0.72	110	0.47

Note. Participants in the original trial were randomized to participate in either 1) Motivational Enhancement Therapy/Cognitive Behavioral Therapy (MET/CBT) + Contingency Management (CM) (2) Drug Counseling (DC) + CM (3) MET/CBT alone or (4) DC alone. Table 1 collapses demographic information across treatment groups.

Table 2

Clinical Trial Eligibility, Randomization, Start and Completion Rates by Race

Variable	African Americans n (screened) = 117		Whites n (screened) = 58		Total n (screened) = 175		Analysis	
	n (%)		n (%)		n		χ^2	df p
Eligible	101 (86.3)		45 (77.6)		146 (83.4)		2.14	1 0.19
Randomized	81 (80.2)		31 (68.9)		112 (76.7)		4.19	1 0.82
Started treatment	78 (96.3)		30 (96.8)		108 (96.4)		3.66	1 0.70
Completed treatment	40 (51.3)		22 (73.3)		62 (57.4)		4.23	1 0.04
Completed 3 Month Follow-Up	29 (36.0)		22 (71.0)		51 (46.0)		11.18	1 <.01
Completed 6 Month Follow-Up	35 (43.2)		21 (67.7)		56 (50.0)		5.40	1 0.03

Note. Eligibility percentages were based on the number of participants deemed eligible divided by the total number screened. Randomization percentages were based on the number of participants randomized divided by the number of participants deemed eligible to participate. The start rate percentages were based on the number of participants who attended at least one treatment session divided by the number of participants who were randomized to a treatment group. The completed treatment rates were based on the number of participants who attended a session in the last week of treatment divided by the number of participants who started treatment. The 3 month and 6 month follow up percentages were based on the number of participants who completed at least one assessment measure divided by the number of participants who were randomized to a treatment group.